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Paul N. Katz

PAUL N. KATZ REG. NO. 35,917

AUGUST 18, 2004 — **EV448724653US**
DATE — **EXPRESS MAIL LABEL**

APPLICATION NUMBER:	09/737,418
FILING DATE:	DECEMBER 14, 2000
FIRST NAMED INVENTOR:	HUSTON, ET AL.
GROUP ART UNIT:	2675
EXAMINER:	SRILAKSHMI K. KUMAR
TITLE:	"SYSTEM AND METHOD FOR COLOR AND GRAYSCALE METHODS FOR GRAPHICAL DISPLAYS UTILIZING ANALOG CONTROLLED WAVEFORMS"
ATTORNEY DOCKET NUMBER:	075115.0176

INCLUDED IN THIS MAILING FOR THE ABOVE-REFERENCED PATENT APPLICATION ARE:

1. APPELLANTS' BRIEF (37 C.F.R. § 1.192) (IN TRIPLICATE);
2. FEE TRANSMITTAL (PTO/SB/17) WITH DUPLICATE COPY FOR FEE PROCESSING;
3. CHECK NO. 898494 IN THE AMOUNT OF $165.00 FOR FILING BRIEF IN SUPPORT OF APPEAL (SMALL ENTITY RATE); AND
4. RETURN POSTCARD TO ACKNOWLEDGE RECEIPT OF ABOVE ITEMS.

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023640

FEE TRANSMITTAL for FY 2004

Effective 10/01/2003. Patent fees are subject to annual revision.

☑ Applicant claims small entity status. See 37 CFR 1.27

TOTAL AMOUNT OF PAYMENT	($) 165.00

Complete if Known	
Application Number	09/737,418
Filing Date	December 14, 2000
First Named Inventor	Huston, et al.
Examiner Name	Kumar, Srilakshmi K.
Art Unit	2675
Attorney Docket No.	075115.0176

METHOD OF PAYMENT (*check all that apply*)

☑ Check ☐ Credit card ☐ Money Order ☐ Other ☐ None

☑ Deposit Account:

Deposit Account Number	02-0383
Deposit Account Name	Baker Botts L.L.P.

The Director is authorized to: (*check all that apply*)

☐ Charge fee(s) indicated below ☑ Credit any overpayments

☑ Charge any additional fee(s) or any underpayment of fee(s)

☐ Charge fee(s) indicated below, **except for the filing fee** to the above-identified deposit account.

FEE CALCULATION

1. BASIC FILING FEE

Large Entity Fee Code	Large Entity Fee ($)	Small Entity Fee Code	Small Entity Fee ($)	Fee Description	Fee Paid
1001	770	2001	385	Utility filing fee	
1002	340	2002	170	Design filing fee	
1003	530	2003	265	Plant filing fee	
1004	770	2004	385	Reissue filing fee	
1005	160	2005	80	Provisional filing fee	

SUBTOTAL (1) ($)

2. EXTRA CLAIM FEES FOR UTILITY AND REISSUE

			Extra Claims		Fee from below		Fee Paid
Total Claims		-20** =		X		=	
Independent Claims		- 3** =		X		=	
Multiple Dependent						=	

Large Entity Fee Code	Large Entity Fee ($)	Small Entity Fee Code	Small Entity Fee ($)	Fee Description
1202	18	2202	9	Claims in excess of 20
1201	86	2201	43	Independent claims in excess of 3
1203	290	2203	145	Multiple dependent claim, if not paid
1204	86	2204	43	** Reissue independent claims over original patent
1205	18	2205	9	** Reissue claims in excess of 20 and over original patent

SUBTOTAL (2) ($)

***or number previously paid, if greater; For Reissues, see above*

FEE CALCULATION (continued)

3. ADDITIONAL FEES

Large Entity Fee Code	Large Entity Fee ($)	Small Entity Fee Code	Small Entity Fee ($)	Fee Description	Fee Paid
1051	130	2051	65	Surcharge - late filing fee or oath	
1052	50	2052	25	Surcharge - late provisional filing fee or cover sheet	
1053	130	1053	130	Non-English specification	
1812	2,520	1812	2,520	For filing a request for *ex parte* reexamination	
1804	920*	1804	920*	Requesting publication of SIR prior to Examiner action	
1805	1,840*	1805	1,840*	Requesting publication of SIR after Examiner action	
1251	110	2251	55	Extension for reply within first month	
1252	420	2252	210	Extension for reply within second month	
1253	950	2253	475	Extension for reply within third month	
1254	1,480	2254	740	Extension for reply within fourth month	
1255	2,010	2255	1,005	Extension for reply within fifth month	
1401	330	2401	165	Notice of Appeal	
1402	330	2402	165	Filing a brief in support of an appeal	165.00
1403	290	2403	145	Request for oral hearing	
1451	1,510	1451	1,510	Petition to institute a public use proceeding	
1452	110	2452	55	Petition to revive - unavoidable	
1453	1,330	2453	665	Petition to revive - unintentional	
1501	1,330	2501	665	Utility issue fee (or reissue)	
1502	480	2502	240	Design issue fee	
1503	640	2503	320	Plant issue fee	
1460	130	1460	130	Petitions to the Commissioner	
1807	50	1807	50	Processing fee under 37 CFR 1.17(q)	
1806	180	1806	180	Submission of Information Disclosure Stmt	
8021	40	8021	40	Recording each patent assignment per property (times number of properties)	
1809	770	2809	385	Filing a submission after final rejection (37 CFR 1.129(a))	
1810	770	2810	385	For each additional invention to be examined (37 CFR 1.129(b))	
1801	770	2801	385	Request for Continued Examination (RCE)	
1802	900	1802	900	Request for expedited examination of a design application	

Other fee (specify) __________

*Reduced by Basic Filing Fee Paid

SUBTOTAL (3) ($) 165.00

SUBMITTED BY

(Complete (*if applicable*))

Name (*Print/Type*)	PAUL N. KATZ	Registration No. (Attorney/Agent)	35,917	Telephone	713.229.1343
Signature	Paul N. Katz			Date	August 18, 2004

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08-19-04

EV448724653US

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PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of: HUSTON, ET AL.	§	Group Art Unit: **2675**
Serial No.: **09/737,418**	§	Examiner: **KUMAR, SRILAKSHMI K.**
Filed: **12/14/2000**	§	
Title: **"SYSTEM AND METHOD FOR COLOR AND GRAYSCALE METHODS FOR GRAPHICAL DISPLAYS UTILIZING ANALOG CONTROLLED WAVEFORMS"**	§	Atty. Docket No.: **075115.0176**

Honorable Commissioner for Patents
Washington, D.C. 20231

Attention: Board of Patent Appeals and Interferences

Dear Sir:

APPELLANTS' BRIEF (37 C.F.R. § 1.192)

This brief is submitted in support of Applicants' Notice of Appeal from the decision dated June 2, 2004, of the Examiner finally rejecting claims 1-10, 12-21 and 23-25 of the subject application. The two-month shortened statutory period for filing the Appeal Brief is due August 23, 2004. Applicants respectfully submit that this Appeal Brief is therefore considered timely filed.

This brief is transmitted in triplicate per 37 C.F.R. § 1.192.

08/23/2004 HTECKLU1 00000072 09737418
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I. IDENTIFICATION OF THE REAL PARTY IN INTEREST

The subject application is owned by and the real party in interest is:

Brillian Corporation
1600 N. Desert Drive
Tempe, AZ 85281

by virtue of assignments by Inviso, Inc. and Three-Five Systems, Inc.

II. IDENTIFICATION OF RELATED APPEALS AND INTERFERENCES

There are no related appeals or interferences.

III. STATUS OF ALL THE CLAIMS, PENDING OR CANCELLED, AND IDENTIFYING THE CLAIMS APPEALED

The application was originally filed with 23 claims. Claims 11 and 22 were canceled and claims 24 and 35 were added during prosecution. Claims 1 and 12 are independent claims. Claims 2-10 and 24 are dependent upon claim 1, and claims 13-21 and 25 are dependent upon claim 12. On June 23, 2004, appellants appealed from the final rejections of claims 1-10, 12-21 and 23-25. Claims 1-10, 12-21 and 23-25 are presented herein for appeal. All pending and appealed claims of the present application are reproduced in Appendix A, attached hereto.

IV. STATUS OF ANY AMENDMENT FILED SUBSEQUENT TO FINAL REJECTION

No amendments have been filed subsequent to the final rejection.

V. SUMMARY OF THE INVENTION

The present invention is a system and method for an optical display that relies upon only two optical states of the light modifying properties of the optical display, an optically "on" and an optically "off" state. This could mean that light is reflected (white) in one state and not reflected (black) in the other. It could also mean that light passes through (transmissive) the optical display in one optical state and does not pass through in the other optical state. It also could mean that light is generated in one optical state and not generated in the other state.

Operation of the invention is binary for its optical properties, *e.g.*, pixels of liquid crystals (LC) in an liquid crystal display (LCD) or pixels of tiny mirrors in a MEM display either produce light (reflective, transmissive, source, *etc.*) or do not, there are no intermediate values of gray scale (*e.g.*, light intensity). The invention maintains the optical state of a pixel for a controlled length of time before changing to the other optical state. Varying the amount of time that a pixel is in either of two optical states determines the intensity or brightness of that pixel (gray scale).

Binary (two state) control of the LC avoids many complications of prior art analog drive methods. Analog control of the LC is far more sensitive to variations in cell gap, temperature, and LC contaminates, requiring high levels of quality control during manufacture of a LC display. Since the LC or mirrors of the present invention display may be driven to either optical state with a wide margin of tolerance, the construction, temperature, material uniformity, *etc.*, of the display is not as critical as in a display dependent upon an analog variation along the EO curve of prior art LC displays.

Rather than following the prior art method of applying a specific analog voltage value to each pixel of a liquid crystal display that corresponds to specific points on the LC EO curve to produce different shades of gray, the present invention compares a video voltage that is representative of a gray scale value desired at a pixel to a reference voltage that controls the duration that the LC is in either the "on" or "off" state. For each frame (or field when using field sequential color), all pixels in the matrix are allowed to become optically on (or off) prior to the application of illumination. When illumination is applied, the reference voltage changes over time, and when the reference voltage matches the video voltage associated with a pixel, that pixel changes optical state (optically on to off, or off to on) at the precise time that the desired video voltage matches the reference voltage. In effect the changing reference voltage determines

the length of time that the pixel is in one of the two optical states before switching to the other optical state.

VI. STATEMENT OF THE ISSUES PRESENTED FOR REVIEW

A. Whether independent claims 1 and 12 are unpatentable, pursuant to 35 U.S.C. § 103(a), over Akiyama *et al.,* U.S. Patent No. 5,977,940 (hereinafter "Akiyama *et al.*").

VII. GROUPING OF CLAIMS

Claims 1-10, 12-21 and 23-25 stand or fall together;

VIII. THE EXAMINER'S RATIONALE FOR REJECTING THE CLAIMS

The examiner's rationale for rejecting independent claims 1 and 12 was stated in the final office action at page 2, and is reproduced as asserted therein as follows:

> As to independent claims 1 and 12, Akiyama et al disclose a display device and a method for driving a display comprising; storing a voltage value in an analog memory associated with each pixel of a display, each of the pixels having a first and a second optical state; Although Akiyama et al do not state where each of the pixels have a first and second optical, it would have been obvious to one of ordinary skill in the art that all pixels have a first and second optical state such as "on" or "white" and "off" or "black" states.
>
> wherein each of the pixels has a comparator associated therewith (col. 9, lines 37-46, 60-67); comparing a reference voltage having values that change in time to the voltage values stored in each of the analog memories associated with each of the pixels (col. 10, lines 1-22, 36-65); changing the optical state of each of the pixels when the respective voltage values match the reference voltage (col. 10, lines 1-22, 36-65). Akiyama et al disclose in col. 10, lines 1-22, 36-65, and in Figs. 2a-e the comparison of the reference voltage, which changes in time, with those of the voltage values stored in the memory. It would have been obvious to one of ordinary skill in the art where the optical state of each of the pixels would be changed depending upon the voltage values in the memories as is required for driving a display. This is clearly shown by Akiyama et al in Figs. 2a-e and in col. 10, lines 1-22 and 36-65.

This also was the examiner's response to arguments made in the Response to the Non-Final Office Action, dated February 24, 2004.

IX. ARGUMENTS OF THE APPELLANTS

No Basis or Support Has Been Shown in the Rejection of the Claims That One Having Ordinary Skill in the Art, at the Time of the Invention, Would Be Motivated to Modify the Reference Relied Upon to Produce the Invention

Appellants respectfully submit that a *prima facie* case of obviousness has not been met. In Akiyama *et al.*, the pixel light intensity is determined by an analog voltage value varying over the EO (electro-optic) curve of liquid crystal (LC) of a liquid crystal display (LCD). Time duration is not a factor in generating the gray scale (light intensity) from the pixels of the LCD. Akiyama *et al.* teach varying a pulse width to generate a certain analog voltage value for a pixel:

> Since the liquid crystal generally operates corresponding to the effective value of the voltage V_{LC}, by varying the pulse width Tw of the voltage V_{LC} , the effective voltage supplied to the liquid crystal layer 5 is controlled. Thus, the optical response (transmissivity of light and reflection rate) is varied and a picture is displayed. Of course, since the average value of the voltage V_{LC} is also controlled, the optical response of the liquid display can be controlled corresponding to the average value of the voltage V_{LC}.

Column 11, lines 42-50 of Akiyama *et al.*

Appellants respectfully submit that Akiyama *et al.* do not teach or suggest using the time duration that a pixel is in a first optical state before switching to a second optical state to produce a desired gray scale for that pixel. Nor do Akiyama *et al.* teach or suggest comparing a reference voltage that changes in time to a voltage value that represents a desired gray scale for each pixel and when the reference voltage and the voltage value match the optical state of the pixel switches from one binary state to the other.

In contrast to the present invention, Akiyama *et al.* applies a analog voltage that may be of any voltage, on the EO curve, to a liquid crystal cell comprising a pixel of a display to

produce a desired point of operation along the analog EO curve of the liquid crystal. The time duration of pixels being in a certain state have no relevance in Akiyama *et al.* for generating a desired gray scale since the analog EO curve of the liquid crystal is used to produce the desired gray scale. Thus in Akiyama *et al.* an analog voltage value is used to set pixels to desired gray scales and the pixels remain at those desired gray scales during the illumination phase of the display until the next video frame which may or may not require different gray scales for the pixels. The present invention has only two binary optical states, "on" and "off." Gray scale is accomplished in the present invention by having the pixels be in one of the optical states for a certain time duration before switching to the other optical state during an illumination phase of the video display. Akiyama *et al.* uses various pixel voltage values for creating pixel gray scales whereas the present invention uses time durations of first and second optical states of the pixels for creating gray scales thereof. Thus Akiyama *et al.* teaches away from the present invention and assertion of Akiyama *et al.* as a prior art reference is improper. Modification unwarranted by the disclosure of a reference is improper. *Carl Schenck, A.G. v. Norton Corp.*, 713 F.2d 782, 787, 218 U.S.P.Q. 698, 702 (Fed. Cir. 1983).

Akiyama *et al.* discloses generating various analog voltage values for generating a gray scale of each pixel by applying a voltage having a certain pulse amplitude and width to the pixel LC cell so as to produce an average voltage based upon the voltage pulse. The resulting averaged voltage created on the LC has a gray scale based upon the EO curve of the LC.

> The profile of the voltage V_{LC} supplied to the liquid crystal layer 5 is a waveform with three values as shown in FIG. 2(e). The amplitude of the voltage V_{LC} is +/- VH. The pulse width Tw has a waveform corresponding to the phase difference between the reference voltage V_{REF} and the voltage Vpix of the pixel electrode. Thus, by varying the level of the analog voltage V1 corresponding to the data signal, the pulse width Tw of the voltage V_{LC} is

> adjusted so as to control the effective value or average value of the voltage supplied to the liquid crystal layer 5.

Akiyama *et al.* at column 11, lines 16-25.

> Since the liquid crystal generally operates corresponding to the effective value of the voltage V_{LC}, by varying the pulse width Tw of the voltage V_{LC}, the effective voltage supplied to the liquid crystal layer 5 is controlled. Thus, the optical response (transmissivity of light and reflection rate) is varied and a picture is displayed. Of course, since the average value of the voltage V_{LC} is also controlled, the optical response of the liquid display can be controlled corresponding to the average value of the voltage V_{LC}.

Akiyama *et al.* at column 11, lines 42-50.

Akiyama *et al.* teaches the prior art of varying an voltage value on a pixel wherein the pixel voltage value is generated from the average of a voltage pulse having a defined amplitude and pulse width. No where in Akiyama *et al.* is it taught or suggested to change the optical state of a pixel a first optical state to a second optical state wherein the pixel is in the first optical state based upon a comparison of a time changing reference voltage and an analog voltage representative of a gray scale. Akiyama *et al.* uses analog voltages of different values to control the respective gray scales of the liquid crystal and relies upon and is subject the EO characteristics of the liquid crystal, thus being subject to all of the problems solved by the present invention. Akiyama *et al.* creates these analog voltage values for the various gray scales based upon averaging voltage pulses on the pixel capacitances, whereas the present invention does not use or rely upon the EO voltage characteristics of the liquid crystal for generating a gray scale.

The present invention utilizes the time durations of the pixels being in a first optical state and a second optical state during an illumination phase of the video display. The present invention effectively converts the voltage value (representing the desired gray scale of a

pixel) into a time duration that the pixel remains in a first optical state before going to the second optical state. This is completely different from what is taught in Akiyama *et al.* The present invention may also be effectively used to drive pixel mirrors in microdisplays (MEMs), organic light emitting diodes (OLED) and other forms of light modifying and generating means that don't necessary have any variable EO characteristics, only binary on and off states. It is not possible to operate these displays based upon the teachings of Akiyama *et al.*

Pursuant to MPEP § 2144.03, incorporated by reference herein for all purposes, Appellants respectfully submit that no substantive document has been disclosed nor asserted that would substantiate that one having ordinary skill in the art at the time of the invention would be motivated to modify Akiyama *et al.* to produce the present invention. The Federal Circuit has noted that:

> "This factual question of motivation is material to patentability, and could not be resolved on subjective belief and unknown authority. It is improper, in determining whether a person of ordinary skill would have been led to this combination of references, simply to "[use] that which the inventor taught against its teacher." *In re Lee*, 61 USPQ2d at 1434, quoting *W.L. Gore v. Garlock, Inc.*, 721 F.2d 1540, 1553, 220 USPQ 303, 312-13 (Fed. Cir. 1983).

Appellants respectfully submit that the obligation required for a *prima facie* determination of obviousness under the holding in *In re Lee* has not been met by relying upon Akiyama *et al.* and knowledge attributed to "one of ordinary skill in the art" to modify Akiyama *et al.* Even the use of hindsight, which is impermissible, cannot be relied upon in the attempt to modify Akiyama *et al.* since to do so would render the invention of Akiyama *et al.* inoperable. Likewise, to apply the teachings of Akiyama *et al.* to the present invention would also render the present invention inoperable. Thus, Appellants respectfully submit that a prima facie case of obvious has not been made for independent claims 1 and 12.

Claims 2-10 and 24 are dependent upon claim 1, and claims 13-21 and 25 are dependent upon claim 12, and contain all limitations thereof. 35 U.S.C. § 112, third paragraph.

Summary

For the foregoing reasons stated hereinabove, Appellants respectfully request that the final rejection of the pending claims be reversed and the application be remanded for allowance of the pending claims, or, alternatively, remand the application for further examination if appropriate references can be found by the examiner.

Appellants believe that there are no additional fees due in association with the filing of this Appeal Brief. However, should the Commissioner deem any additional fees as being due, including any fees for any additional extensions of time, the Commissioner is requested to accept this as a Petition Therefor, and is hereby authorized to charge any additional fees due, or to credit any overpayment, to Baker Botts L.L.P. Deposit Account No. **02-0383**, Order Number **075115.0176** under 37 C.F.R. § 1.16 or § 1.17.

Respectfully submitted,

BAKER BOTTS L.L.P. (023640)

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ATTORNEY FOR APPLICANTS

Date: August 18, 2004

APPENDIX A

1. A method for driving a display, comprising the steps of:

storing a voltage value in an analog memory associated with each pixel of a display, each of the pixels having a first and a second optical state;

comparing a reference voltage having values that change in time to the voltage values stored in each of the analog memories associated with each of the pixels; and

changing the optical state of each of the pixels when the respective voltage values match the reference voltage values.

2. The method as recited in claim 1, wherein the display is an active matrix panel display.

3. The method as recited in claim 1, and further comprising the step of applying illumination while the reference voltage changes values in time.

4. The method as recited in claim 3, wherein the reference voltage is changed as a function of time for causing each pixel to change state at a desired time.

5. The method as recited in claim 1, wherein the states of groups of the pixels are changed, and further comprising the step of changing the states of the groups of the pixels in multiple phased cycles.

6. The method as recited in claim 5, wherein the groups are interspersed on the display to avoid flicker at low update rates.

7. The method as recited in claim 1, wherein the pixel provides illumination.

8. The method as recited in claim 7, wherein the display is an organic light emitting diode display (OLED).

9. The method as recited in claim 8, wherein the states of groups of the pixels are changed, and further comprising the step of changing the states of the groups of the pixels in multiple phased cycles.

10. The method as recited in claim 9, wherein the groups are interspersed on the display to avoid flicker at low update rates.

12. A system for driving a display, comprising:

a display having a plurality of pixels, each of the plurality of pixels having a first and a second optical state;

an analog memory associated with each of the plurality of pixels, wherein a voltage value associated with each of the plurality of pixels is stored in the associated analog memory;

a plurality of comparators, each of the plurality of comparators associated with a one of the plurality of pixels, wherein the plurality of comparators compare the stored voltage values with a reference voltage having values that change in time and indicate when the stored voltage values match the reference voltage values; and

logic for changing the optical state of the pixels whose associated voltage values match the reference voltage values.

13. The system as recited in claim 12, wherein the display is an active matrix panel display.

14. The system as recited in claim 12, and further comprising logic that applies illumination after the change of state of the at least one pixel.

15. The system as recited in claim 14, wherein the reference voltage is changed as a function of time for causing each pixel to change optical state at a desired time.

16. The system as recited in claim 12, wherein the optical states of groups of the pixels are changed in multiple phased cycles.

17. The system as recited in claim 16, wherein the groups are interspersed on the display to avoid flicker at low update rates.

18. The system as recited in claim 12, wherein the pixel provides illumination.

19. The system as recited in claim 18, wherein the display is an organic light emitting diode display (OLED).

20. The system as recited in claim 19, wherein the states of groups of the pixels are changed, and further comprising the step of changing the states of the groups of the pixels in multiple phased cycles.

21. The system as recited in claim 20, wherein the groups are interspersed on the display to avoid flicker at low update rates.

23. The system as recited in claim 12, further comprising:

a level shifter for each of the pixels, wherein the level shifter changes a lower voltage to a higher voltage for output to a pixel electrode of the associated pixel.

24. The method as recited in claim 1, wherein the voltage value in at least a portion of the analog memories is adjusted for providing gamma correction.

25. The system as recited in claim 12, wherein the voltage value in at least a portion of the analog memories is adjusted for providing gamma correction.